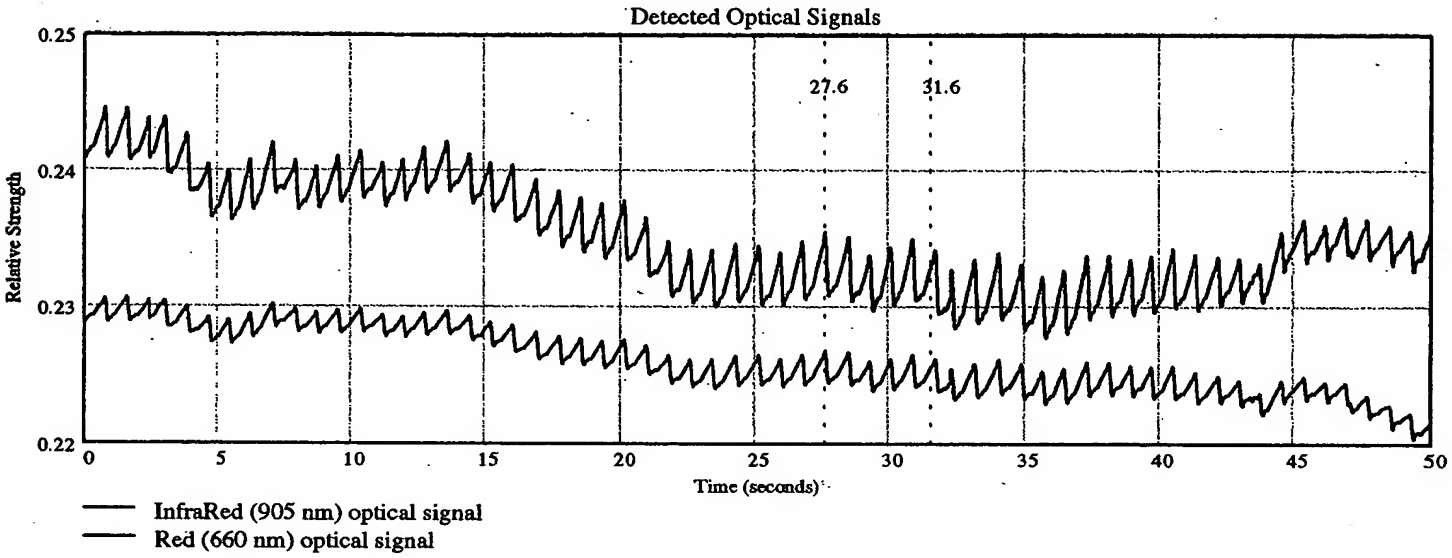


Figure 1. Detected optical signals from an adult male over a 50 seconds time interval. Markers indicate section from which subsequent photopleths were extracted and filtered.

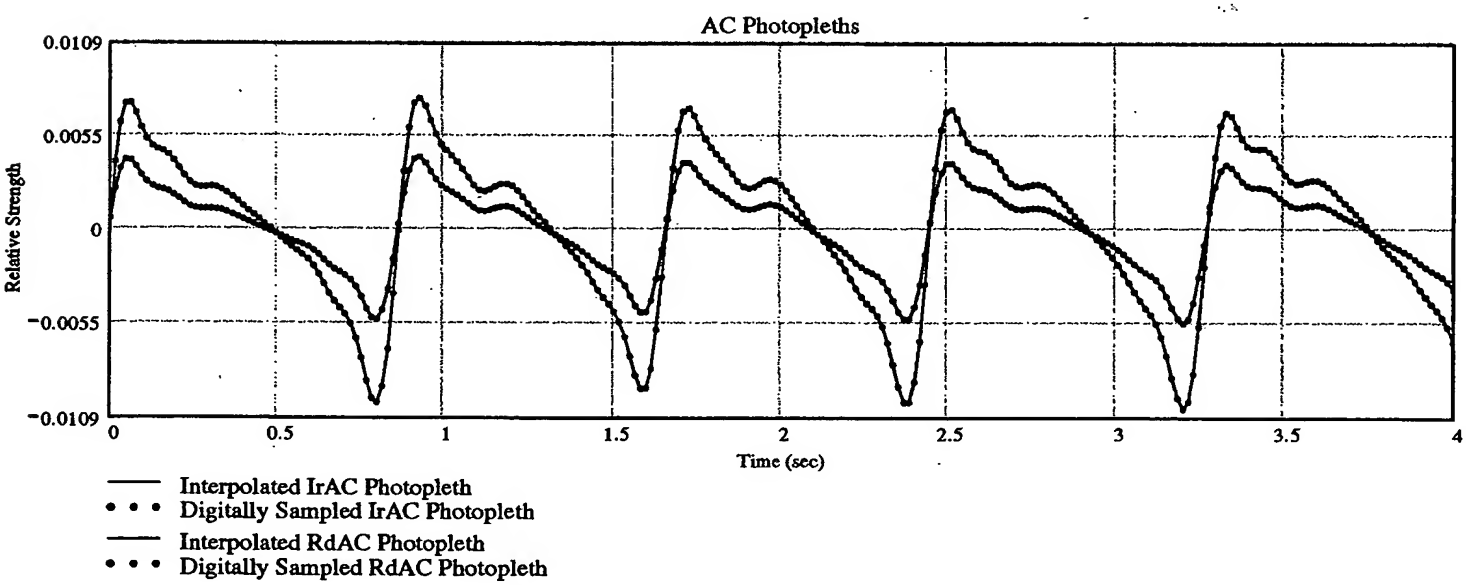


Fig. 2. Normalized and Bandpassed Red and InfraRed photopleths vs.time. Digital sampling rate is 62.5 Hz.

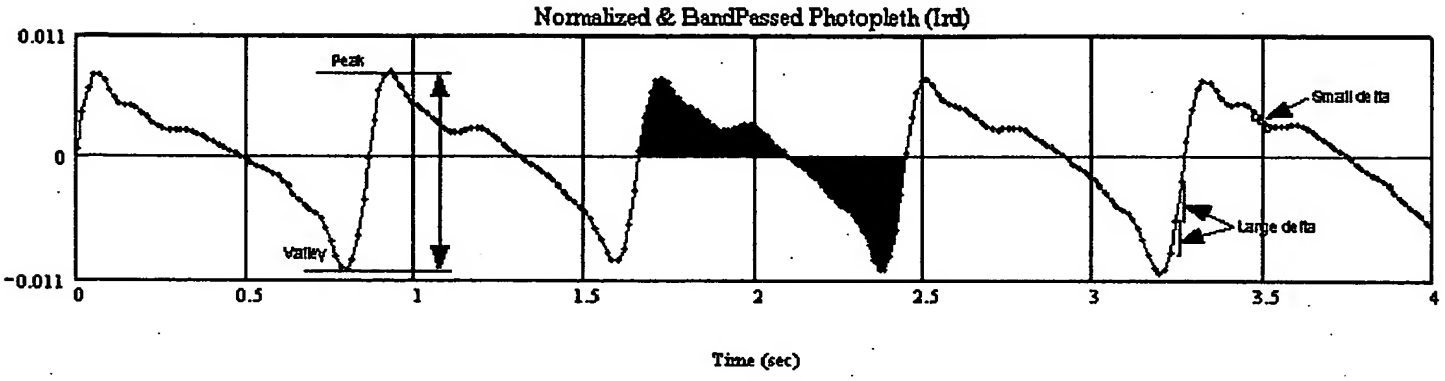


Figure 3. Previous techniques for calculating the strength of a photopleth. Peak-to-valley, area and differential technique (Biox pulse oximeter.)

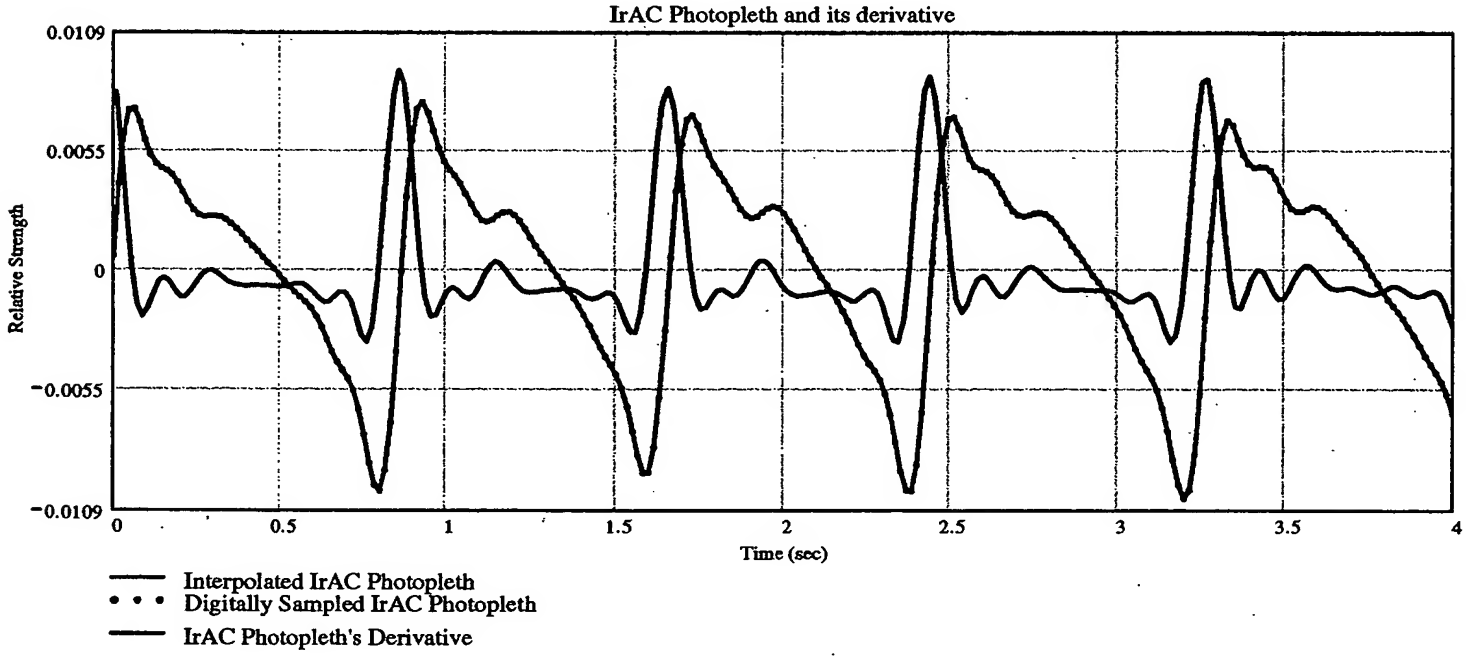


Fig 4. IrAC photopleth and its derivative vs. time

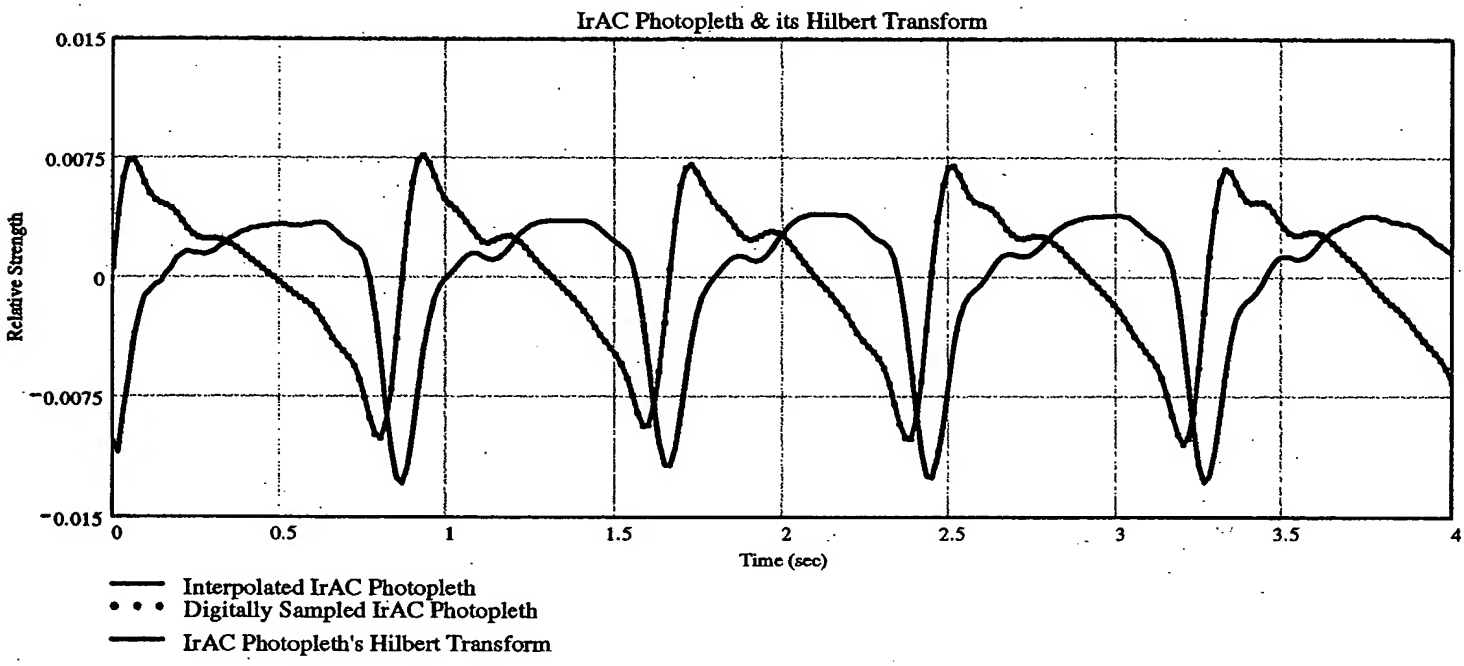


Fig 4A. IrAC photopleth and its Hilbert Transform vs. time

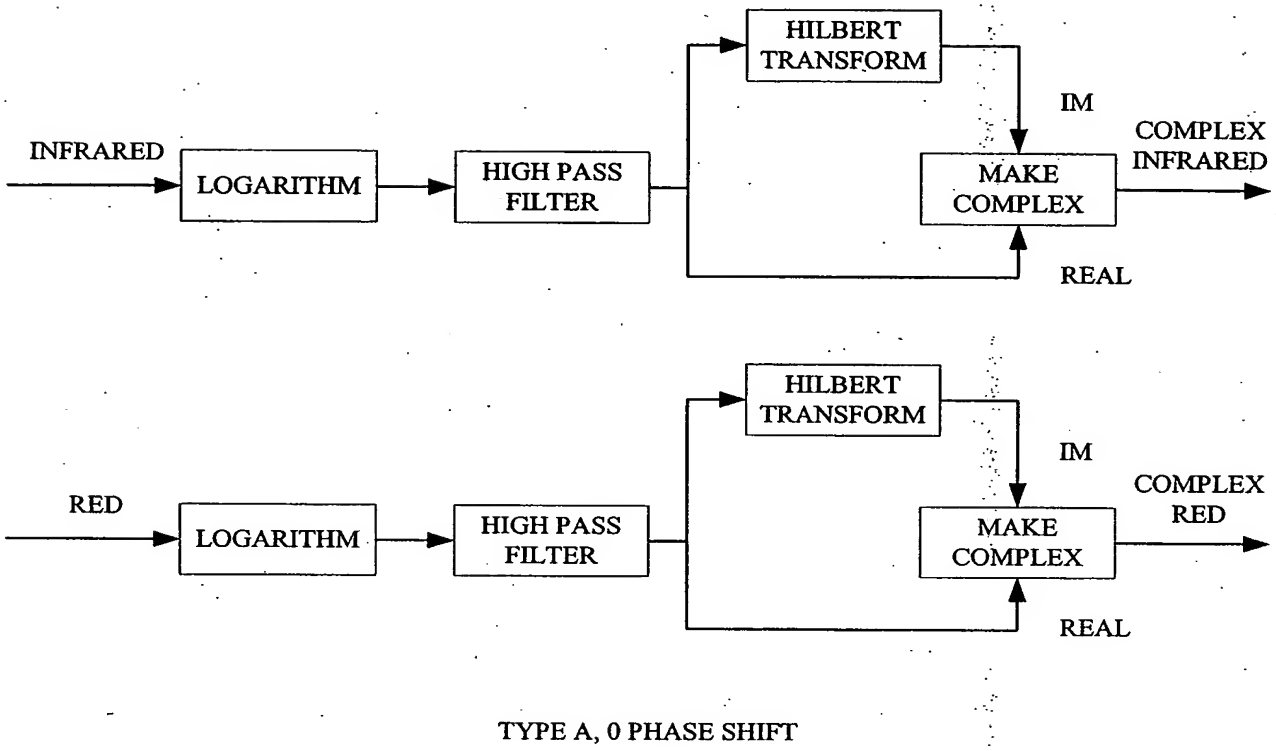


Figure 5. Block diagram to generate type A complex photopleth waveforms

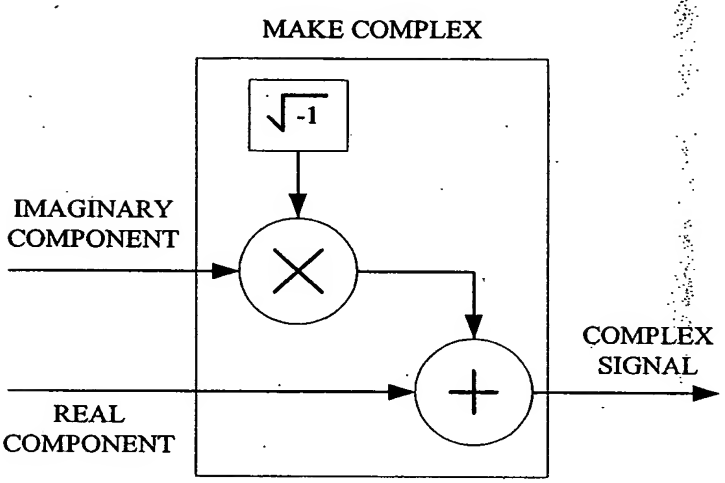


Figure 5A. Block diagram to make complex signals

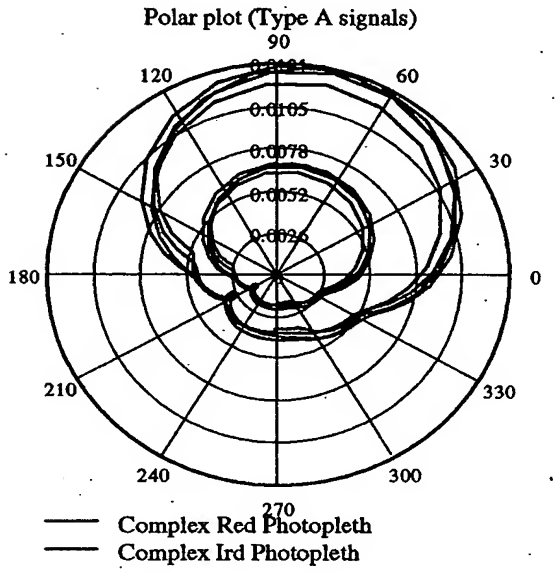


Figure 6. Polar plot of type A complex photopleths

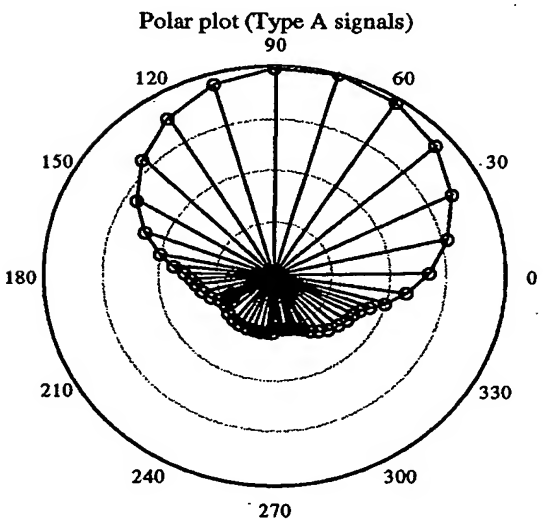


Figure 7. Area calculation for type A complex photopleth

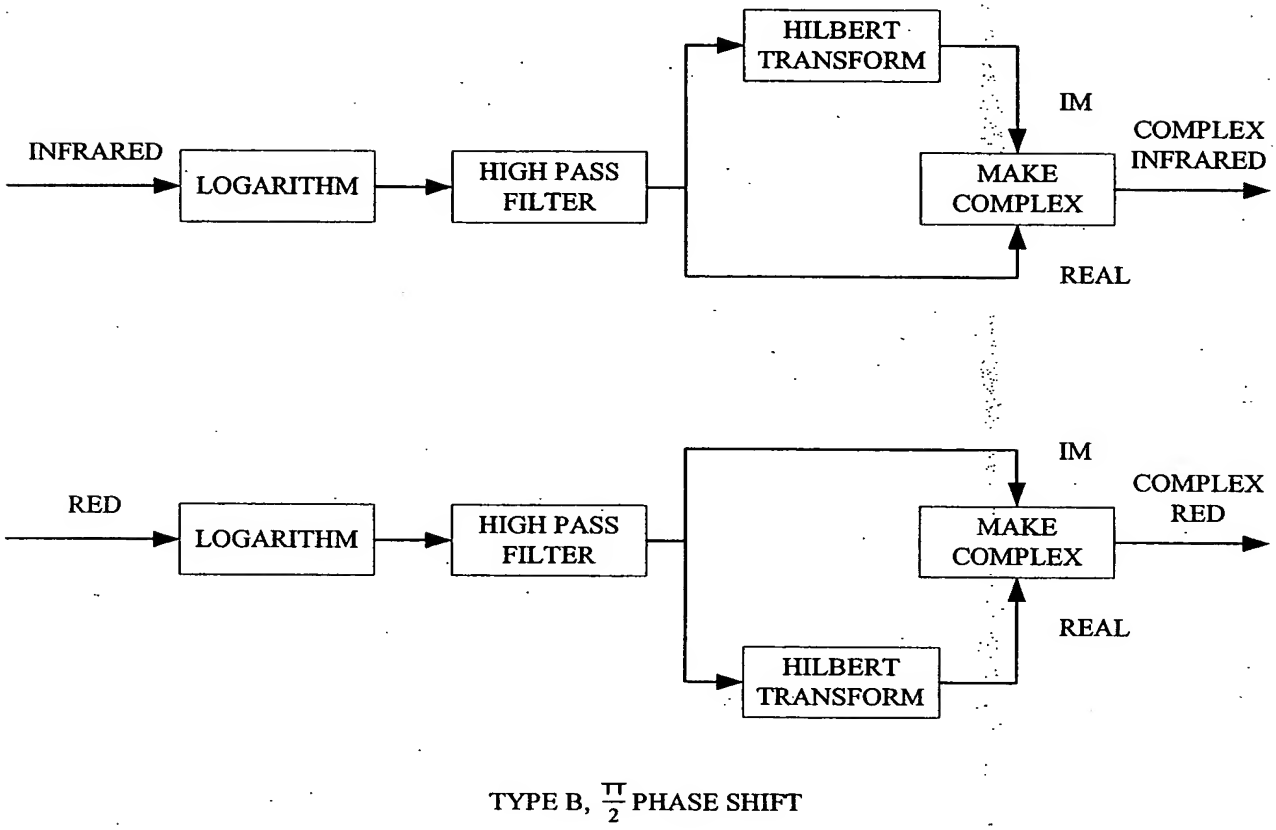


Figure 8. Block diagram to generate type B complex photopleth waveforms

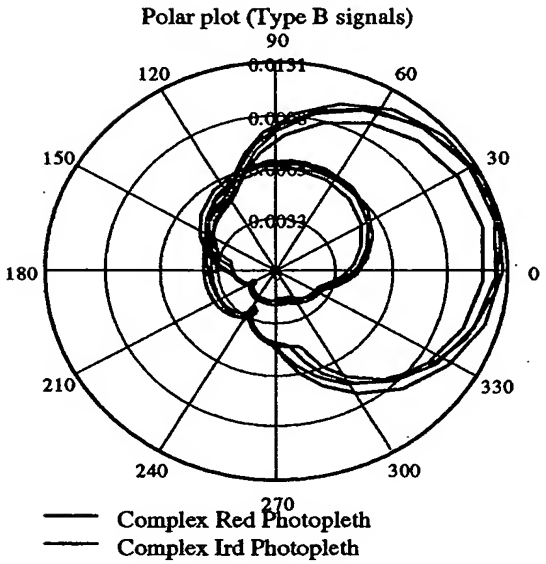
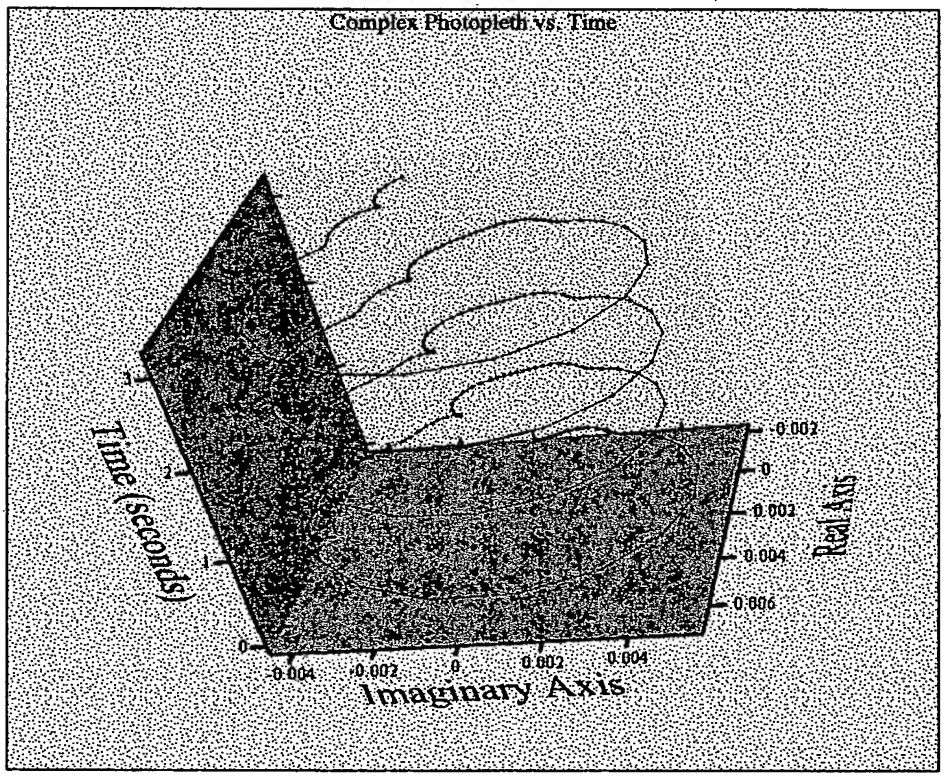


Figure 9. Polar plot of type B complex photopleths



C

Fig. 10. 3D plot of type B complex photopleth vs. time

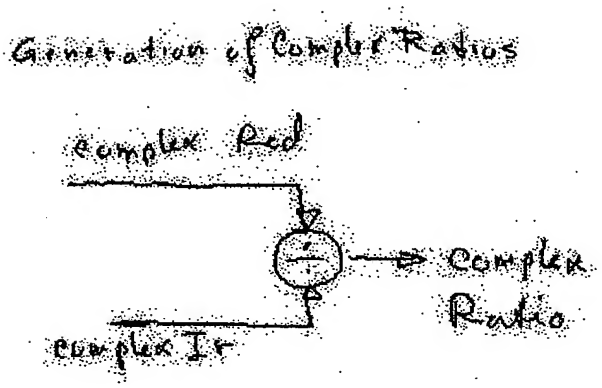


Figure 11. Block diagram for generating complex ratios

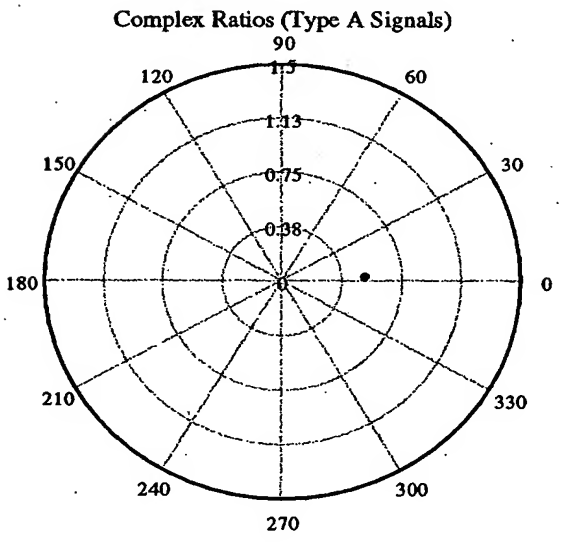


Figure 12. Complex ratios, steady saturation, for type A signals

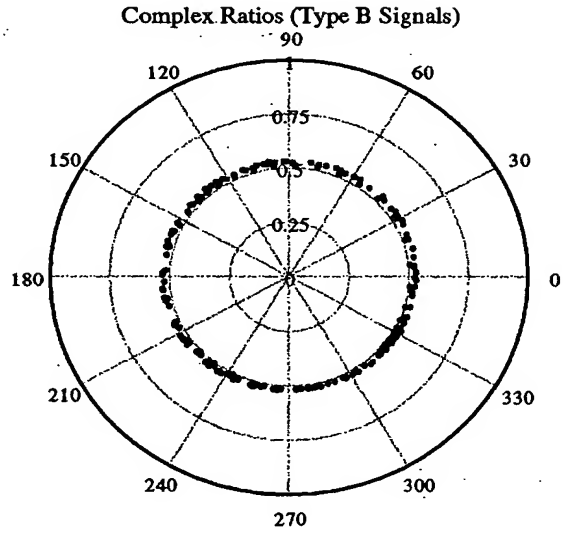
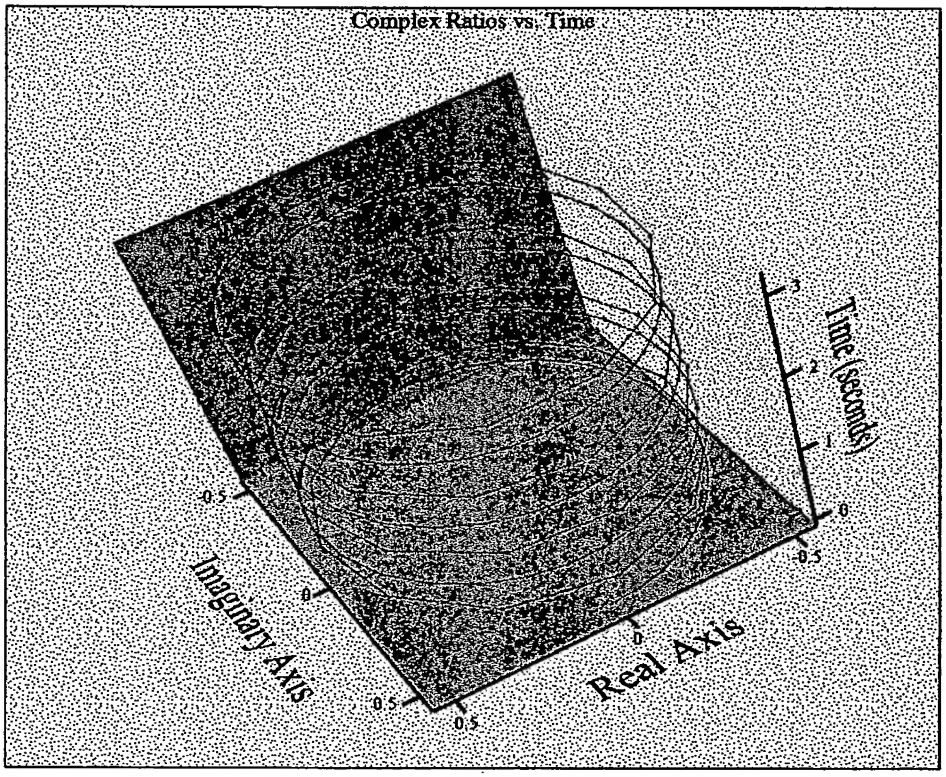


Figure 13. Complex ratios, steady saturation, for type B signals



C

Figure 14. 3D plot of Complex ratios vs. time

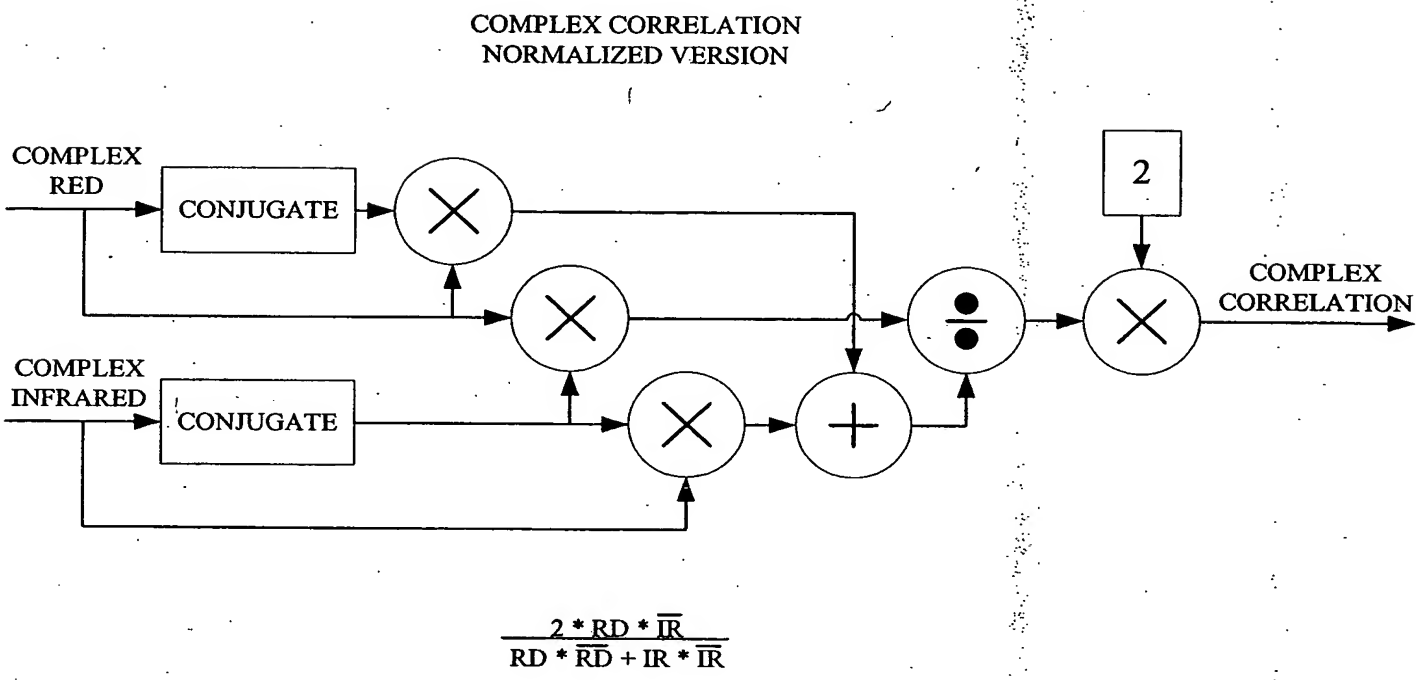


Figure 15. Block diagram to generate complex correlations

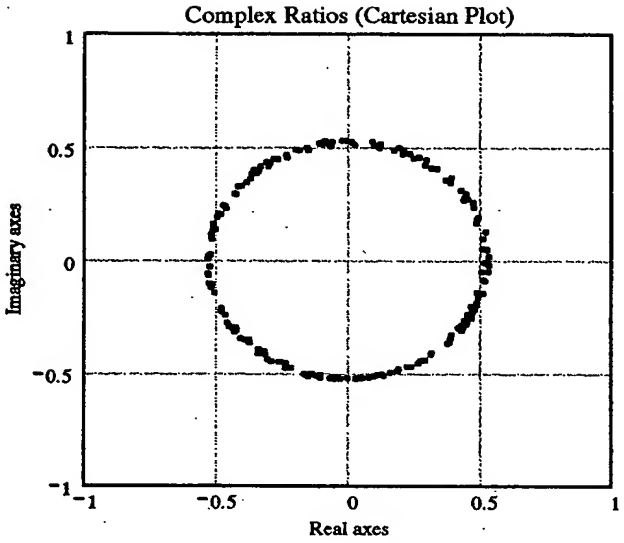


Figure 16. Complex ratios, steady saturation, for type B signals

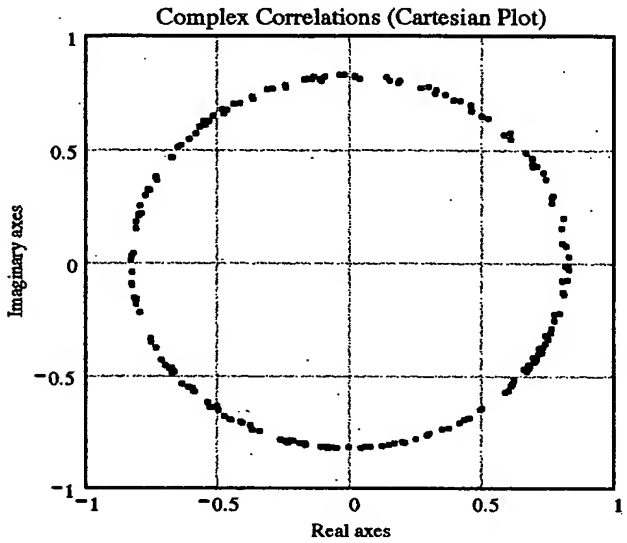


Figure 17. Complex correlations, steady saturation, for type B signals

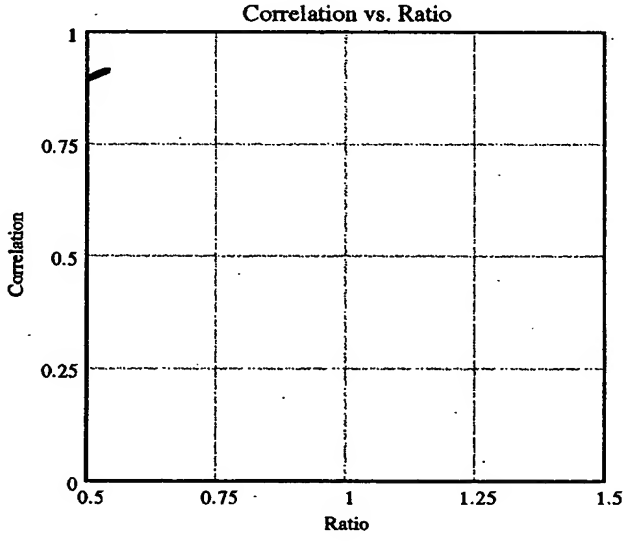


Figure 18. Square root of the magnitude of the complex correlation vs. ratio

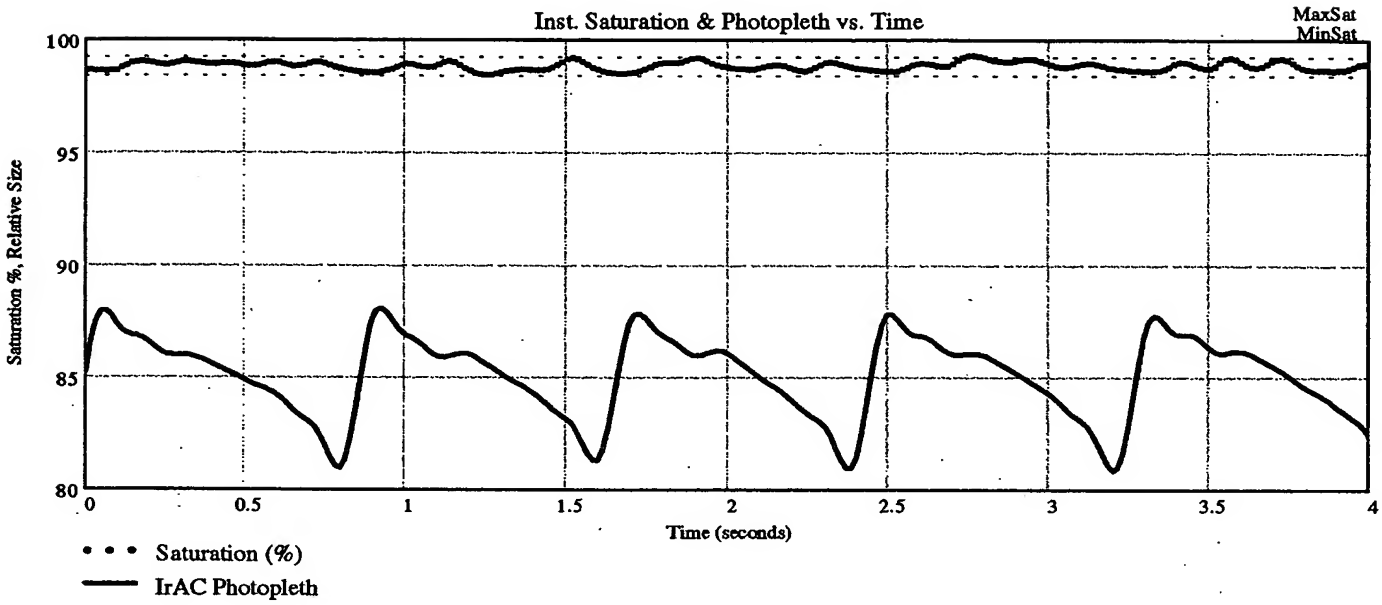


Fig. 19 Instantaneous saturation vs. time and corresponding Infrared photopleth

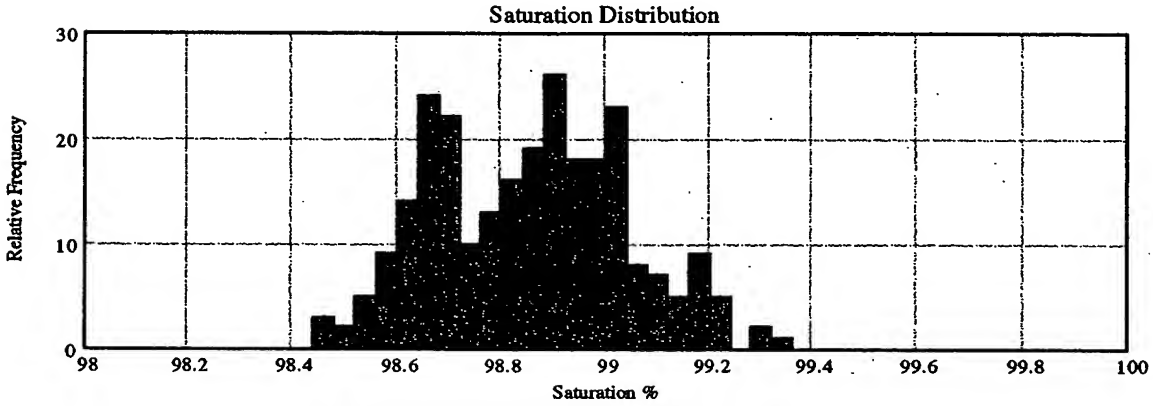


Fig. 20. Expanded view of the saturation distribution of the results of Figure 19. Note the bimodal shape of the distribution.

Standard Deviation	StdError = 0.18 %
Mean Satuartion Value	AverageSat = 98.9 %
Maximum Deviation from the mean	ΔSat = 0.47 %

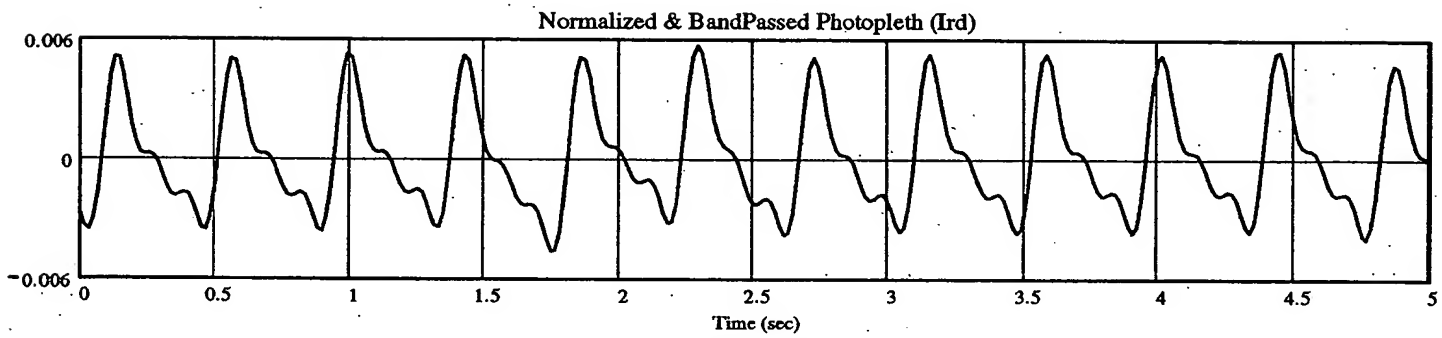


Figure 21. Infrared Photopleth

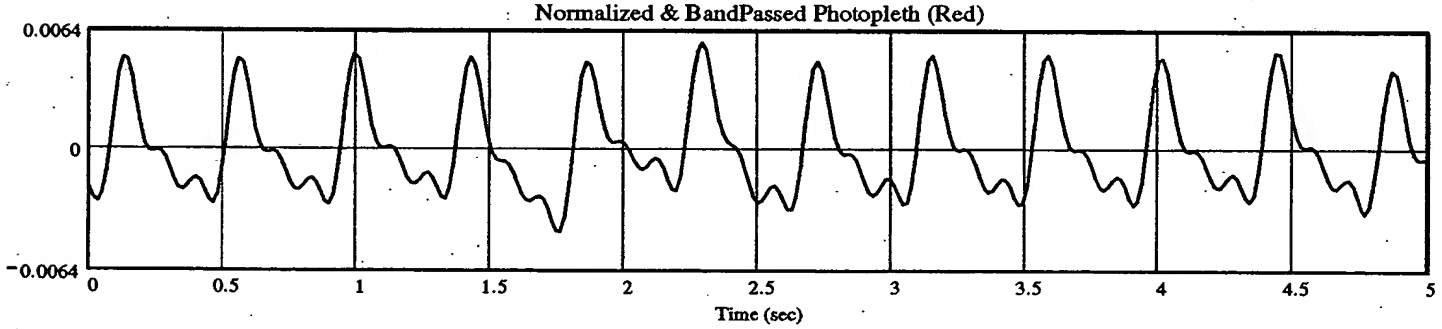


Figure 22. Red Photopleth

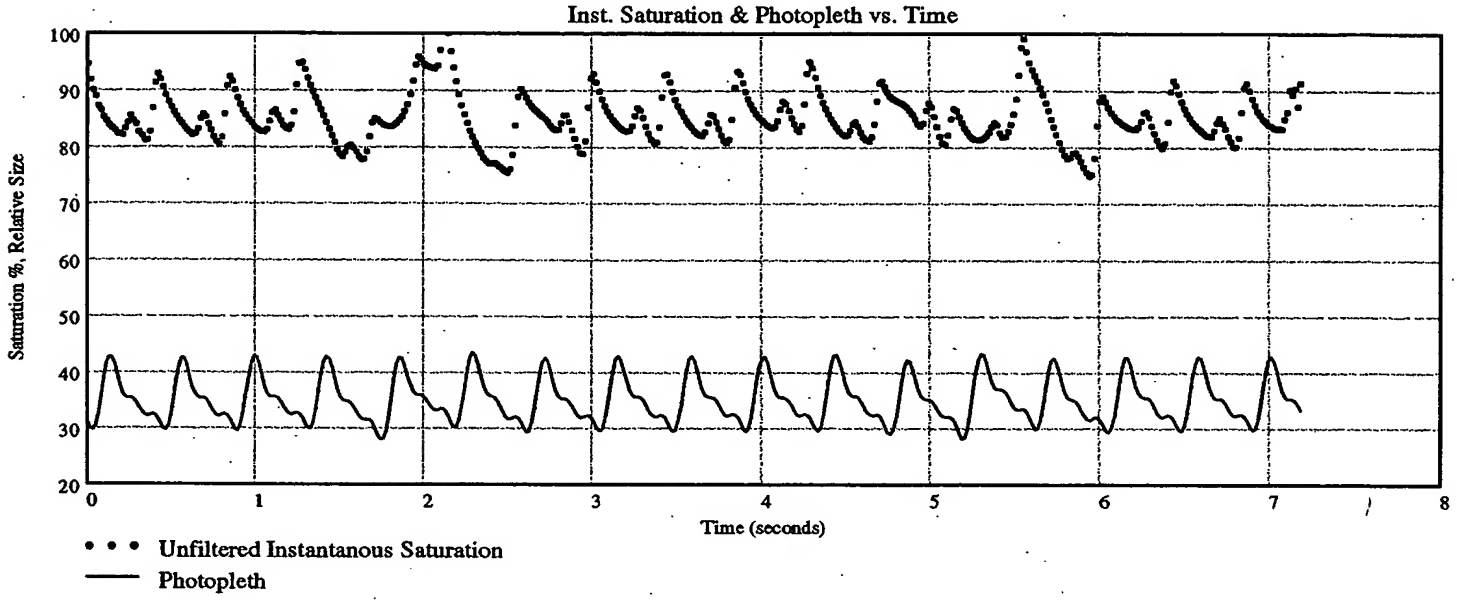


Figure 23. Instantaneous saturation with venous pulsation and photopleth vs.time

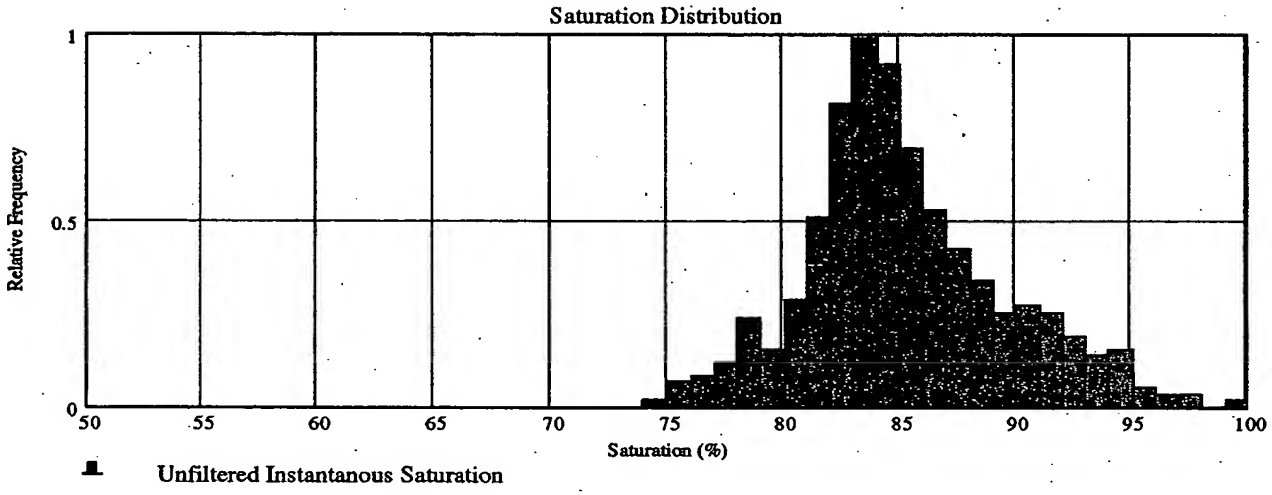


Fig. 24. Satuartion distribution of the data in Figure 23

Standard Deviation	StdError = 4.5 %
Mean Satuartion Value	AverageSat = 85.3 %
Maximum Deviation from the mean	ΔSat = 25.13 %

Mode at 83.5%

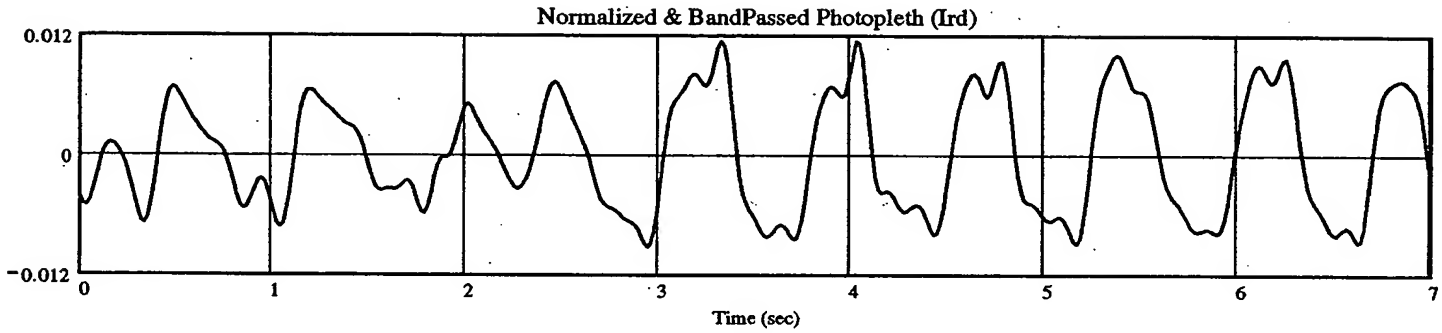


Fig. 25. Infrared Photopleth disturbed by motion artifacts

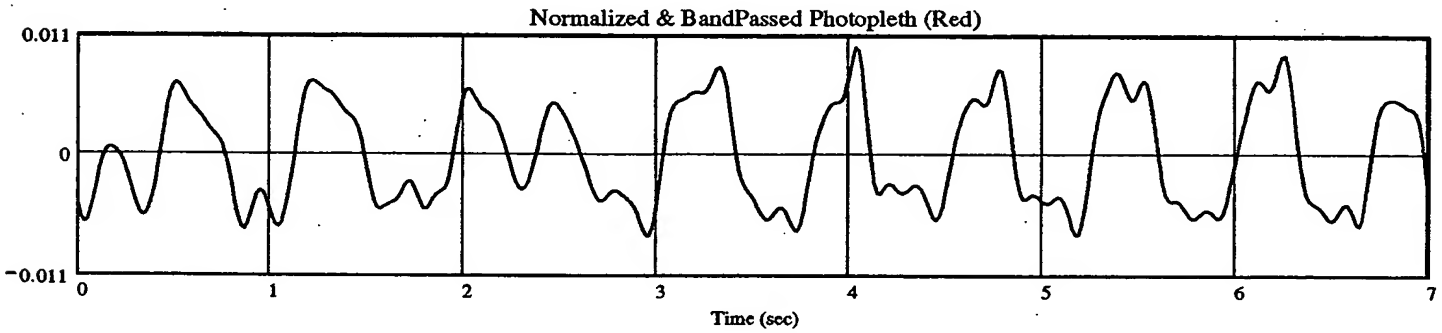


Fig. 26. Red Photopleth disturbed by motion artifacts

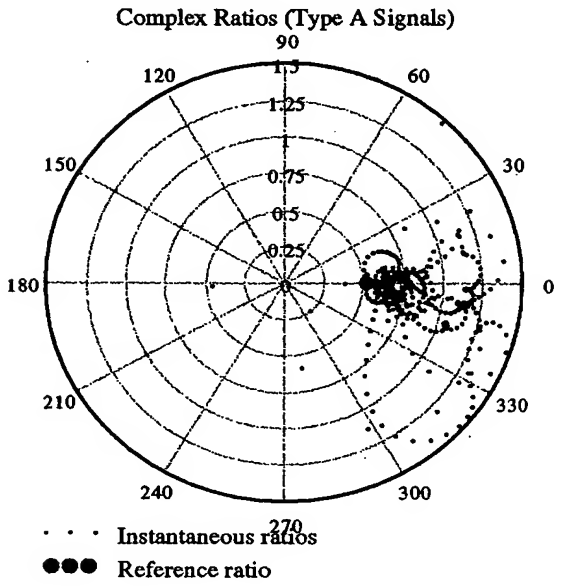


Fig 27. Polar plot of instantaneous ratios vs. phase angle

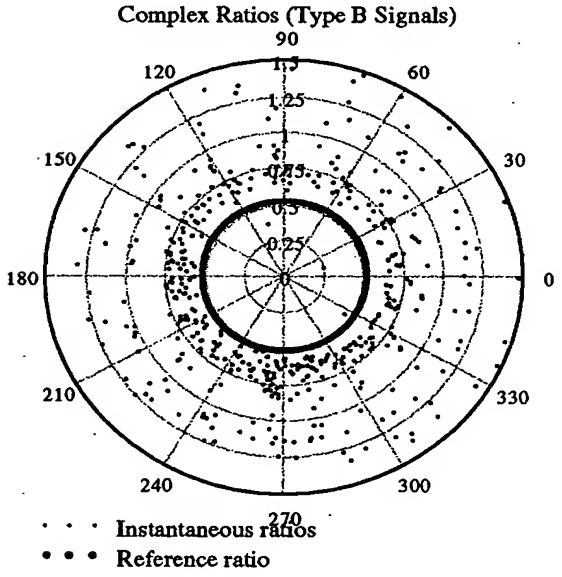


Fig 28. Polar plot of instantaneous ratios vs. phase angle

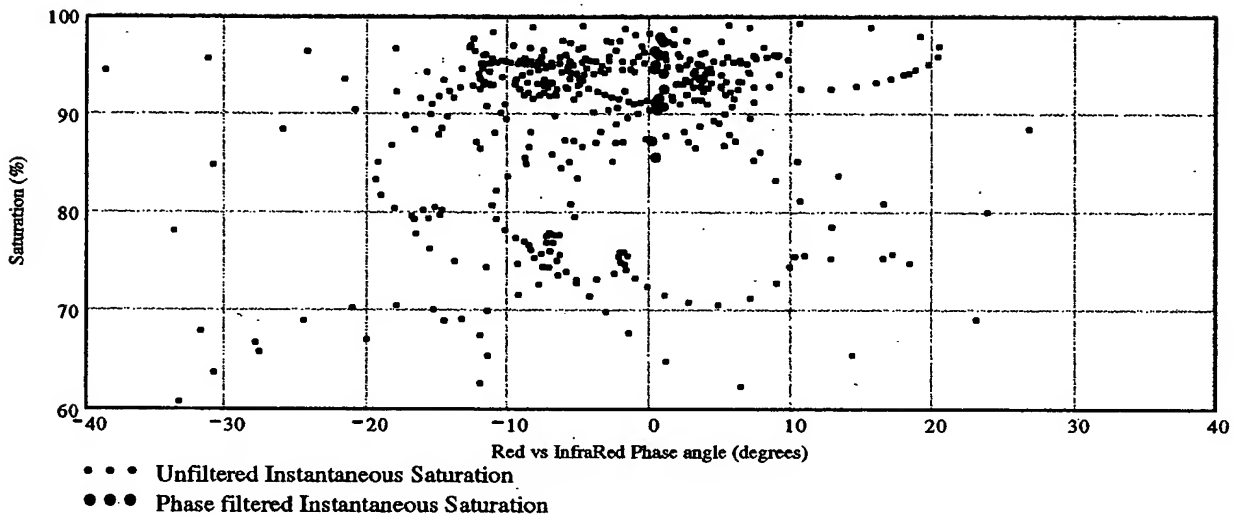


Fig. 29. Instantaneous saturation vs phase angle (degree)

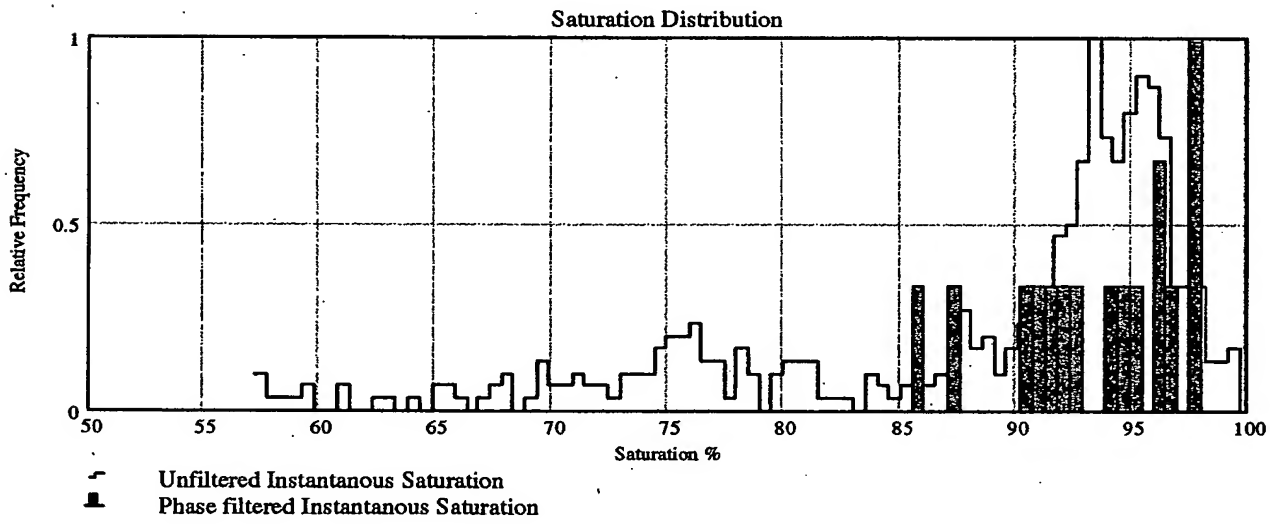


Fig. 30. Instantaneous saturation distribution

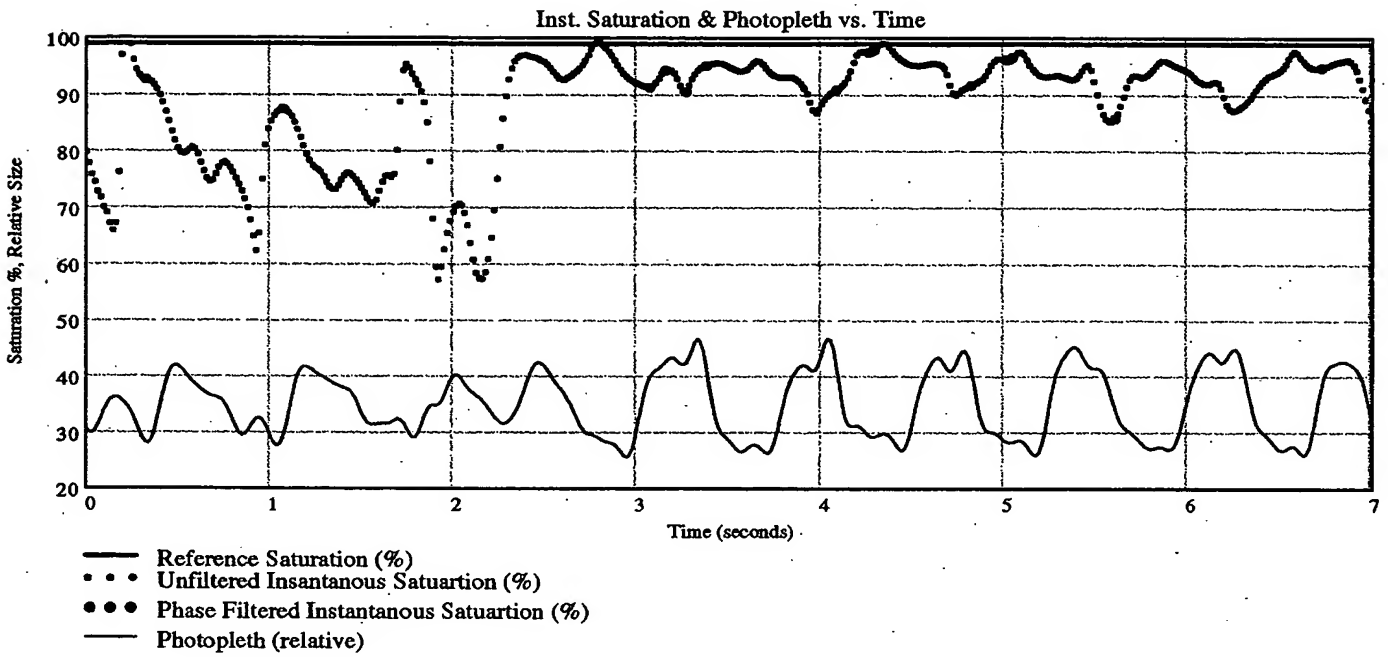


Figure 31. Instantaneous saturation with motion artifacts disturbance and photopleth vs. time

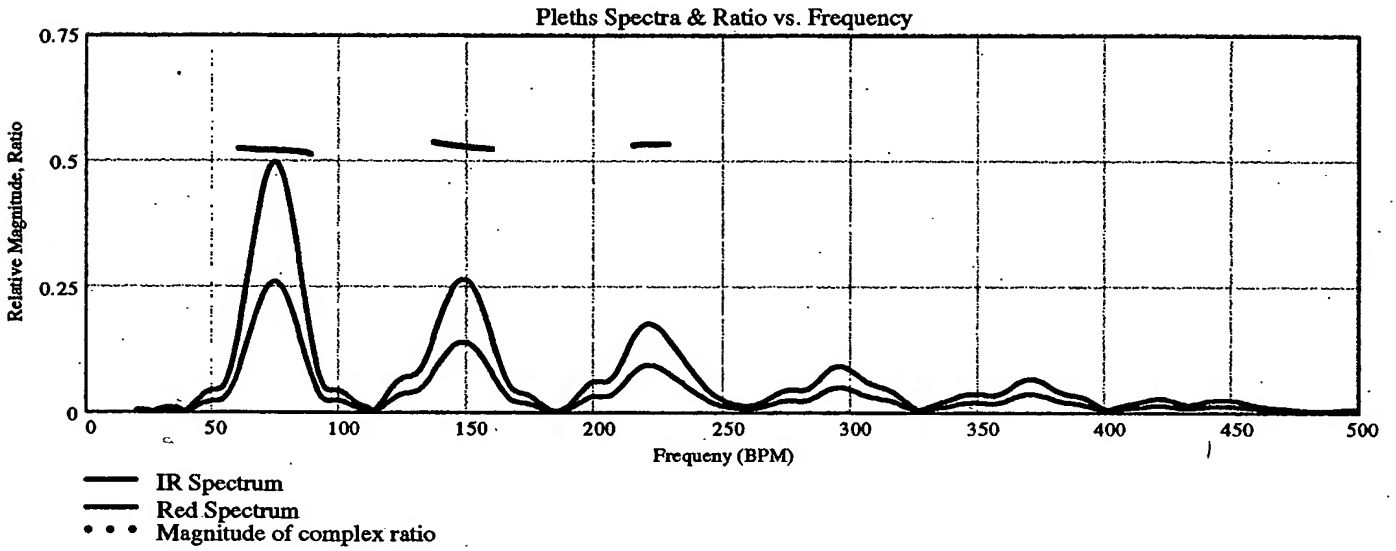


Figure 32. Magnitude of the frequency domain ratiosfor the photopleths shown in Figure 2.

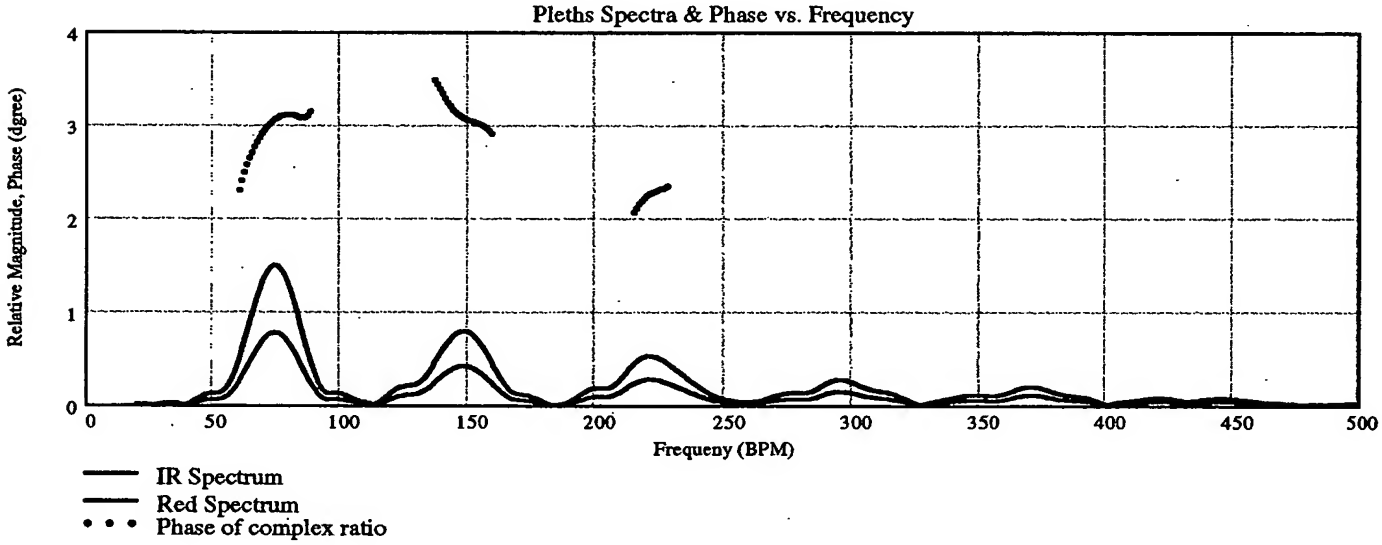


Figure 33. Phase (degrees) of the frequency domain ratios for the photopleths shown in Figure 2.

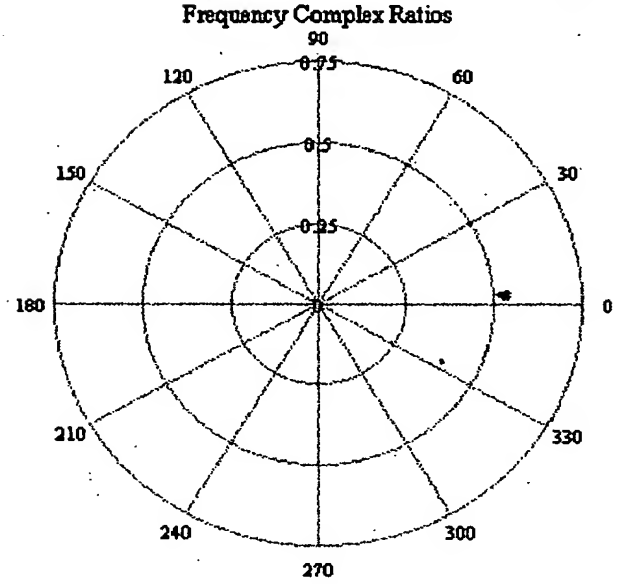


Figure 34: Polar plot of frequency complex ratios